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COMPOSITION AND ABUNDANCE OF REPTILES AND AMPHIBIANS OF THE CLARK MOUNTAIN AREA
SAN BERNARDINO COUNTY, CALIFORNIA
MAY 1978 - SEPTEMBER 1978

James V. Mitchell

for

Bureau of Land Mgt.
1695 Spruce Street
Riverside, CA 92507

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INTRODUCTION

The Clark Mountain area is one of the most interesting areas of southern California. Situated in the northeast corner of San Bernardino County, Clark Mountain lies only a few miles from the Nevada border, about 60 miles southwest of Las Vegas, Nevada. In the midst of a high desert region, Clark Mountain is positioned between the western edge of the Mojave desert and the southeastern edge of the Great Basin deset and serves as a probable mixing ground for plant and reptile species occurring in both deserts. One example of this is the intergradation of *Crotalus mitchelli pyrrhus* with *Crotalus mitchelli stephensi* which may occur near the Clark Mountain Range. At the eastern and western bases of Clark Mountain there exists prime creosote bush scrub occupying an elevation of about 2600 feet to 3200 feet. Joshua tree starts to invade around 3200 feet, especially on the eastern slope. The joshua tree woodland really manifests itself well between an elevation of about 3800 and 4500 feet. A mixed yucca and cacti association is evident on the western slope beginning about 3200 feet also and extends to about 4500 feet where pinyon and juniper trees start to appear on all exposures of Clark Mountain. Along washes and watercourses (mostly below 5000 feet) there exists the desert willow wash habitat, composed primarily of desert willow (*Chilopsis linearis*), various cacti, and an occasional juniper or pinyon tree. There is a white fir forest on the northern face of Clark Mountain starting around 6500-6800 feet and reaching toward the 7929 foot summit. Fi-

nally, there are a few sites which could be considered riparian (Pachalka Spring, Green's Well, Ivanpah Springs, one or two spots in Colosseum Gorge, and reservoirs at Mountain Pass), but for the most part the springs feed into cattle troughs and there is no running water except where the water should overflow.

One should expect that a change in elevation of some 5000 feet over a few miles would not only create a multitude of different habitats but would also make possible a tremendous amount of variety in the animal life. One is not disappointed in the number of reptile and amphibian species. Clark Mountain falls within the ten species isopleth for desert flatland lizards as described by Pianka (1965). Altogether, thirteen species of lizards (flatland and upland), seventeen species of snakes, and one species of amphibian are known to inhabit Clark Mountain and its immediate vicinity (range maps and accounts of Stebbins, 1966), with three other lizard species as possible residents. Uma scoparia and Dipsosaurus dorsalis are both restricted to sandy areas of relatively low elevation, especially in Uma's case. There may be suitable habitat for both or either of these species near Clark Mountain. The last of these possibles is Heloderma suspectum; there are reports of Heloderma occurring in the Clark Mountain Range but they are infrequent and largely unsubstantiated. Stebbins (1966) makes reference to Heloderma in the Clark Mountain area. If these reports are true it would probably make Clark Mountain the only location in California where gila monsters can be found, and would further add to the interest and unique qualities of the area.

METHODS AND MATERIALS

Time in the field seeking the reptiles and amphibians amounted to twenty-six days during May through September of 1978. The majority of the field work was conducted in May and June with four trips being made to Clark Mountain during each of these months. Three field trips were made in July, and one each in August and September. In addition to composition and abundance figures for each habitat in the Clark Mountain area, a collection was made of representative specimens of each species.

Collecting and the gathering of data was accomplished while driving down roads (dirt and paved, by day and night), through the use of can traps, and from excursions into the field, actively searching for specimens. Driving Cima Road in mid-morning during May and June was very fruitful. Callisaurus, Phrynosoma, Crotaphytus wislizenii, and Cnemidophorus appeared to use the pavement in great numbers as a source to raise the body temperature more rapidly, as the vertebrate distribution forms and DOR data show. The pavement may also serve in an additional manner; many pairs of Callisaurus and Phrynosoma were observed on it and it may be that the warming road functions as an attractive site for reproductive activity. This would be an interesting topic for further research. At night, the pavement retained the day's heat more readily than did the adjacent soils and in response, nocturnal snakes and lizards paused upon it while crossing it. Night drives on Cima Road and the freeway from the Cima Road intersection to a point

about twelve miles south of the Nevada-California border were conducted. Most of the dirt roads had raised shoulders composed of small boulders up to several hundred pounds to help prevent washouts, and these raised borders, serving as basking and foraging stands, seemed to concentrate lizard species, notably Uta and Callisaurus. Drives along these dirt roads were done with one eye keeping a close watch on these boulders. All DOR's were removed from the roadway after the data had been collected so as not to create confusion with subsequent DOR's. On excursions in the field, surface litter such as boards, cans, sheet metal, cattle dung, rocks and dead and fallen plant stumps and branches were turned over. Abandoned buildings and mine shafts and tunnels were also searched.

Age and sex identification, along with the habitat in which it was encountered, was attempted on every individual observed. Size and sexual dimorphism aided in this process of identification. Sexual dimorphism is very prominent in Uta, fairly prominent in Callisaurus, Sceloporus magister, and Crotaphytus collaris, and in Crotaphytus wislizenii at times. Noosing was accomplished from within the car many times; lizards wary of the human form seemed not as worried when a car stopped near them. All lizards not kept for the collection were toe clipped. Since only abundance of species was needed and not movement and territoriality data on individual specimens, toe clipping was simplified. A middle toe on the right rear foot was used for this purpose. Non-poisonous snakes not needed for the collection were either tail clipped or ventral scale clipped in addition to being spray painted black just above the anal region.

Rattlesnakes were simply spray painted black. Length of snakes that were released was estimated or roughly measured with a yardstick.

Fifty 5-gallon can traps and fifty 1'x 1' thin, brown, pressed board lids were supplied by the U.S. government and employed in four different habitats. They were not used in the rocky slope habitat for obvious reasons. The mixed yuccas and cacti habitat also proved to be too rocky so drives and walking counts were used there. There was also a problem in getting the traps up to the white fir forest region so sampling was done by footwork only. Can traps were placed in creosote/joshua-tree, riparian, pinyon-juniper, and desert willow wash habitats and checked at least once on every trip to the Clark Mountain area. For exact locations of can trap sets, see Figures 1 through 4. Lids were of two designs early in the study. A movable, hinged type resting flush with the ground surface and a raised type affording shelter immediately above the can hole were both used. The lid was held about 1-1½" above the surface by rocks and held in place by a rock placed on top of the board. Later in the study, all lids were of the latter design as this one seemed to provide the best results.

In addition to the can traps and lids, the government also supplied 15 minute topographic maps of the Clark Mountain, Ivanpah, Roach Lake, and Mescal Range quadrangles which were the source for distances, elevations, and locations mentioned in this report. Vertebrate distribution forms for recording species data were also provided.

Glass museum jars with screw-type plastic lids, ranging

in size from 2 oz. to 32 oz., were used for the collection. Several gallon size jars were also used for the larger snakes. Denatured alcohol or 10% formalin solution were injected into the specimens with a hypodermic syringe and were also used to permanently preserve them in. Specimens intended for the collection were killed by freezing and any measurements taken were done so after thawing had occurred. Specimens were given a strip of plastic with a coded number punched on it; this refers to the number in the separate catalog which contains all the data for each individual.

RESULTS

Because it would have taken considerable time, effort, and field research and techniques to attempt to gather absolute abundance figures on all species known to inhabit the Clark Mountain area, abundance of reptile and amphibian species was figured on a relative basis. Twenty-five days in the field is just not enough time in which to gather complete data on so many species. The large size and numerous habitats existing in the study area shaped the decision to compute abundance of the species in relation to one another. The main objectives of this study were to find out the species composition of each habitat and to obtain representative specimens of each species for a collection.

The creosote - joshua tree association is the habitat that covers the largest area in the Clark Mountain area and also

contained the highest number of reptile species. A can trap line consisting of ten traps was placed in operation on May 11 and terminated August 13 in T17N, R12E, S16SW (Fig. 1). The site was just north of the powerline road at an elevation of 3280 feet. The area consisted primarily of creosote bushes and scattered joshua trees with patches of sandy soil. The site was chosen because it was in an intermediate zone between pure creosote bush scrub and pure joshua tree woodland. _Uta_, _Cnemidophorus_, _Sceloporus magister_, _Phrynosoma_, _Crotaphytus wislizenii_, _Chionactis_, _Phyllorhynchus_, and _Salvadora_ were trapped at this site and _Callisaurus_, _Crotalus cerastes_, and _Arizona_ were seen in the site or in immediately adjacent area. The portion of Cima Road from the freeway north to the powerline road extends through this habitat and was driven extensively in order to pick up other species. This provided _Coleonyx_, _Rhinocheilus_, _Crotalus scutulatus_, _Pituophis_, and _Masticophis flagellum_. _Urosaurus_, _Crotaphytus collaris_, and _Lampropeltis_ were found at widely scattered locations. Tables 1 thru 3 contain the complete list. Night driving Cima Road provided a total of sixteen snakes (Fig. 6) during the months of May and June. No snakes were found after June 23 on Cima Road although night drives were continued until August 31. Thirty of the thirty-four snakes observed during the entire study period were found within the months of May and June (Fig. 5). Some of the disparity is due to more days spent in the field during these two months (sixteen days compared to ten for July, August, and September) but there still appears to be a definite pattern of

snake abundance associated with the early summer period. Stebbins (1966) and Fowlie (1965) both report similar experience with collecting snakes - the spring months seem to be the best for optimum snake collecting. *Callisaurus* was the most abundant lizard in the creosote - joshua tree habitat and certainly the most visible, sunning along Cima Road and basking conspicuously along the shoulders of the powerline road. Following *Callisaurus* in descending order of abundance were *Uta*, *Phrynosoma*, *Cnemidophorus*, *Sceloporus magister*, and *Crotaphytus wislizenii*. The remaining thirteen species found in the creosote - joshua tree habitat made up about 11% of the total number of reptiles seen (Table 3).

Yuccas, agave, creosote, and various cacti are the main plant species that comprise the mixed yuccas and cacti habitat on Clark Mountain. The soil is generally a rocky hardpan but there are a few sandy areas in the drainages in the surrounding slopes. *Uta*, *Callisaurus*, *Xantusia*, *Sceloporus magister*, *Phrynosoma*, *Cnemidophorus*, *Coleonyx*, and *Crotaphytus collaris* were the eight lizard species encountered in the mixed yuccas and cacti habitat (Table 4) and are listed here in order of abundance, with *Uta* being the most abundant reptile species. One *Crotalus mitchelli* and one *Hypsiglena* were the only snakes that were seen in this particular habitat (Table 2). The *Hypsiglena* and the majority of the *Xantusia* were observed beneath dead agaves and yuccas. Small rocks were favored by *Callisaurus* and *Uta* as basking sites or possibly as vantage points for making foraging runs. Soulé (1964) states that the population density

of Uta in Baja California is greater in rocky terrain with a covering of dense shrubs than in sandy habitats. This study found this to be true in the Clark Mountain area also; many more Uta were seen at the upper limit of the mixed yuccas and cacti habitat than at the lower limit where it merges with creosote bush scrub. Although the stretch of dirt road from Ivanpah Springs down to the freeway was driven after sunset on several occasions, the only reptiles seen in the mixed yuccas and cacti habitat at night were a Coleonyx on July 8 and a Phrynosoma on July 28, both at about 8:30 p.m. PDT.

The desert willow wash habitat is characterized by the desert willow (Chilopsis linearis), cacti, and mesquite at the lower elevations. At higher elevations, the mesquite is replaced by an occasional pinyon or juniper tree. A willow wash habitat of the latter variety was sampled with the help of a set of eight can traps that were dug in on June 24 and taken up on September 2. The site was two miles west of Green's Well, between the dirt road that leads to Green's Well from the powerline road and a limestone slope with Utah agave. The exact location was T17N, R13E, S17NE at an elevation of 4840 feet. The area sampled measured approximately 100 feet by 100 feet or .1 hectare. The site was chosen for can traps because of the proximity of the limestone slope and the chance that species of that habitat might be caught; several of the cans were within 10 feet of the base of the slope. Uta, Cnemidophorus, Sceloporus magister, one Eumeces, and one Hypsiglena were captured in the traps (Fig. 3). The Eumeces and Hypsiglena were both

juveniles and were caught in the traps nearest to the limestone slope. Trapped *Utas* outnumbered the total of the other four trapped species combined. *Callisaurus*, *Phrynosoma*, and *Crotaphytus wislizenii* were seen on or near the trap site to make the total number of lizard species seen in the willow wash habitat seven, and the total number of species eight, including the *Hypsiglena* (Table 5). The *Crotaphytus wislizenii* seen on August 13 was the individual of that species observed at the highest elevation - 4900 feet, in a border area between willow wash and pinyon-juniper habitats. The abundance scale for the desert willow wash habitat in decreasing order of abundance is *Uta*, *Callisaurus*, *Cnemidophorus*, *Sceloporus magister*, *Phrynosoma*, *Crotaphytus wislizenii*, and *Eumeces* and *Hypsiglena* tied with one each (Table 5), when all willow wash habitats are considered.

The habitat classified as rocky slope is represented in the Clark Mountain area largely by limestone slopes which support Utah agave (*Agave utahensis*), and at an elevation, for the most part, between four and six thousand feet. Some of the locations where this habitat was sampled were: 1) in a canyon about one mile west of Pachalka Spring; and 2) an area above a willow wash habitat just north of the dirt road that leads to Green's Well from the powerline road. Only six species of lizards were counted from the Utah agave slope regions (Table 6) and are listed here in decreasing order of abundance - *Uta*, *Crotaphytus collaris*, *Sauromalus*, *Sceloporus magister*, *Phrynosoma*, and *Cnemidophorus*. *Uta* and *Crotaphytus collaris* made up

roughly 75% of all reptile sightings in this habitat type. No snakes were seen on the Utah agave slope. There are many crevices and escape routes for the reptiles in this situation and specimens were difficult to find and obtain. No Sauromalus were collected and only one Cnemidophorus and two Phrynosoma were seen. Lynn (1963) maintains that Phrynosoma are usually not seen in any appreciable concentration in any habitat type and the only habitat in the Clark Mountain area which seemed to contain any number was the creosote - joshua tree, the habitat with the largest area in this study. Uta and Crotaphytus collaris were fairly easy to capture by noosing as long as this was performed in the morning before the lizards had reached normal body temperature and activity.

Most of the sampling for reptiles and amphibians of the riparian habitat type was done at Ivanpah Springs, which is at an elevation of 4000 feet on the eastern slope of Clark Mountain. The site is surrounded by mixed yuccas and cacti habitat and is situated at T17N, R13E, and S24SE. Ten can traps were placed in position on May 20 and taken up on September 2 in an area measuring about 100 feet by 100 feet (.1 hectare). The vegetation consisted of large creosote bushes, cacti, yuccas, agave, and mesquite and cottonwood very close by. There was a water trough filled with water from the time this study began until it was discovered dry on June 23 and was located only a few yards from the edge of the study area. Uta, Sceloporus magister, Cnemidophorus, and Callisaurus were the most abundant lizards and were followed in order by Phrynosoma, Sceloporus

occidentailis, Crotaphytus wislizenii, and Coleonyx. All fell victim to can trapping with the exception of Phrynosoma and Sceloporus occidentalis, which was not found at Ivanpah Springs but at Pachalka Spring. Salvadora was caught twice in can traps in June and Pituophis was taken in the area beneath the cottonwood tree one afternoon in June. Bufo punctatus was seen at Green's Well and is dealt with later in this report. Can trap results are summarized in Fig.2 and abundance and composition in Tables 1, 2, and 7. A total of ten hatchling Utas were can trapped and started showing up on July 28. All specimens noosed or can trapped and released were marked and none fell into a can a second time. The juvenile Salvadora and the juvenile male Callisaurus were the only two found dead inside the can traps. Three can traps at Pachalka Spring netted only two juvenile Sceloporus magister over a period of almost a month and a half (traps put in May 27, removed July 7). The elevation was 4880 feet and the location was T17N, R12½E, and S36NE. The traps were placed in the shade under large trees in a brushy canyon into which a small stream ran (overflow from a trough).

The pinyon-juniper woodland is composed primarily of Pinus monophylla and Juniperus osteosperma with assorted smaller bushes and grasses. Five can traps were placed in an area 50 by 100 feet near an old, abandoned shed. The elevation was 5120 feet and the site was located in T17N, R13E, and S16NE, about one mile west of Green's Well, just north of the dirt road that leads to Green's Well from the powerline road. Only two Utas,

one juvenile Eumeces, and one juvenile Xantusia were trapped by the cans that were placed in operation on July 21 and taken up on September 2. Sceloporus occidentalis, Crotaphytus collaris, Crotalus mitchelli, and Masticophis taeniatus were seen in the study site or immediate vicinity. Cnemidophorus was seen on several of the trips made up the north face of Clark Mountain. Uta was the most abundant species of the pinyon-juniper habitat and was followed in order by Sceloporus occidentalis, Crotaphytus collaris, Sceloporus magister, with the other five species observed in this habitat making up a small percentage of the total number of individuals (Table 8). On the excursions up the north face of Clark Mountain, Utas and Sceloporus occidentalis comprised almost all the individuals seen. The Sceloporus occidentalis of the higher elevations appeared to be darker and more wary than those of lower elevations. No can traps were taken up the side of Clark Mountain; all were put in down by the shed.

Starting between 6500 and 6800 feet, a white fir forest is evident on the north face and begins to displace many of the pinyon and junipers. One trip up to this habitat was initiated on July 29 but had to be aborted when a threatening thunderstorm settled over the mountain and began to rain. Another trip was taken on August 13 but the lower limits of the forest were reached and no reptiles were observed there. Finally, one hatchling Uta and several Sceloporus occidentalis (Table 9) were seen well inside the boundaries of the fir forest on September 2. Crotalus mitchelli and other species probably could

have been found in this habitat also if more time had been available for searching.

Not one individual of the species _Bufo punctatus_ was found in the field during the entire study. The waterhole at Valley Wells was checked during the day and the night on several occasions with no success before it was observed dry on July 7. The Pachalka Spring area was searched, once in late May and once in early July. Colosseum Gorge was scoured many times near the locations where water seeps up toward the surface and collects in very small pools in the road. Rocks and brush were overturned near the moist areas but no toads were ever found. The reservoir at Green's Well, owned by a Mr. Smith and his son Jim Smith, was searched on one day and on one night, but this was in late July, presumably after the toads' activity peak in spring. The Smiths' told of hearing the toads' singing earlier in the year around the reservoir and in Colosseum Gorge and exhibited on July 22 an adult, mummified _Bufo punctatus_ that they said they had taken early one morning in late May or early June next to their reservoir at Green's Well.

The presence of _Heloderma suspectum_ in the Clark Mountain area is suspected by many, Cochran and Goin (1970) and Stebbins (1966) being among those. Clark Mountain would seem to offer _Heloderma_ suitable habitat as rocky hillsides and lush arboreal desert situations are present throughout most of the foothills with a northern exposure. The gila monster prefers conditions such as these to the more barren flatlands (Pianka, 1965). _Heloderma_ is nocturnal and summer rains seem to stimulate activity

and emergence from a fasting condition which it can maintain up to three years in times of severe drought (Pianka, 1965). The lizard's range to the west is limited by the low amounts of summer rain and the long droughts that occur west of the Colorado River (Pianka, 1965). The search for Heloderma was conducted mainly in the hour preceding sunset and the hour after sunset. A lantern was used during darkness to show the way. The foothills east and south of Ivanpah Springs, with a range of elevation of about 3500 to 4200 feet, were examined in this manner on many occasions but a gila monster was never observed. This area appeared to be the place where Heloderma would be found if it were to be found, as the elevation, vegetation, and rainfall figures agreed fairly closely to those described by Pianka (1965) and Stebbins (1966). Mine tunnels were checked along these slopes and also in an area west of Keany Pass and northwest of Green's Well, just south of the powerline road. No trace was found of Heloderma. When questioned about the presence of Heloderma, Mr. Smith said that in twenty-five years of roaming the Clark Mountain area he had seen only one gila monster. He had seen it during 1977 about 2½ miles northwest of Green's Well, near the dirt road in T17N, R13E, S8NW at an elevation of 4500 feet. The vegetation type is joshua tree woodland with some desert willow and many boulders close by. This area was also searched during this study but no gilas were seen. Although Mr. Smith described the lizard perfectly, he could not pinpoint the time of year when he saw it, and there remains some doubt concerning the reliability of his report.

Two individuals intended for the collection laid eggs before becoming preserved specimens. A Crotaphytus wislizenii noosed on May 26 from Ivanpah Springs laid eight eggs on June 4. The eight eggs were white and measured 12-13 mm. by 22-24 mm. and were preserved with the lizard. The leopard lizard had a snout-vent length of 126 mm. and a total length of 344 mm. and had the vermillion blotches typical of gravid females of this species. Smith (1946) reports the maximum recorded snout-vent length of Crotaphytus wislizenii at 119 mm. and the normal clutch size at two-four eggs, which are laid during the first half of July. A Phyllorhynchus decurtatus, caught on June 9 while night driving Cima Road, also laid eggs. The five eggs were laid on July 14 and were white. The snake measured 17" in total length. Three of the five eggs managed to be saved and preserved with the parent snake.

SUMMARY

Thirteen species of lizards, thirteen species of snakes, and one species of amphibian were found in the Clark Mountain area. Lizards far outnumbered snakes and were seen almost exclusively during the day while the majority of the snakes were nocturnal.

The creosote - joshua tree association contained the highest number of reptile species at 19, while in the white fir forest only 2 species were detected. Ten species were observed from the mixed yuccas and cacti habitat, 8 from the desert wil-

low wash habitat, 6 from the Utah agave slope habitat, 11 from riparian situations, and 9 from the pinyon-juniper habitat.

Uta stansburiana was the most abundant lizard of the mixed yuccas and cacti, desert willow wash, riparian, Utah agave slope, and pinyon-juniper habitats. Callisaurus was the most abundant species in the creosote - joshua tree habitat. Uta was the only species found in each habitat type; Cnemidophorus and Sceloporus magister were seen in all except the white fir forest.

No snake species was found in great numbers and finds tended to be scattered except for a concentration of many species along Cima Road.

Bufo punctatus was found only in a riparian situation at Green's Well and was represented by a lone, mummified, adult specimen.

No Heloderma were found in the Clark Mountain area although suitable habitat seems present.

LITERATURE CITED

Cochran, D.M. and Goin, C.J. 1970. *The New Field Book of Reptiles and Amphibians*. G.P. Putnam's Sons, New York, New York.

Fowlie, J.A. 1965. *The Snakes of Arizona*. Azul Quinta Press, Fallbrook, California.

Lynn, R.T.. 1963. Comparitive Behavior of the Horned Lizards, Genus *Phrynosoma*, of the United States. Ph. D. Thesis, Univ. of Oklahoma, *Univ. Microfilms*, Ann Arbor, Michigan.

Pianka, E.R. 1965. Species Diversity and Ecology of Flatland Desert Lizards in Western North America. Ph. D. Thesis, Univ. of Washington, *Univ. Microfilms*, Ann Arbor, Michigan.

Smith, A.M. 1946. *Handbook of Lizards*. Lizards of the United States and Canada. Comstock Publishing Co., Inc., Ithaca, New York.

Soulé, M.E. 1964. Evolution and Population Phenetics of the Side-Blotched Lizards (*Uta stansburiana* and its relatives) on the Islands in the Gulf of California, Mexico. Ph. D. Thesis, Stanford University, *Univ. Microfilms*, Ann Arbor, Michigan.

Stebbins, R.C. 1966. *A Field Guide to Western Reptiles and Amphibians*. Houghton Mifflin Company, Boston, Massachusetts.

CAN TRAP DATA FOR 8 MI. NORTH OF INT. 15 ON CIMA ROAD,
SAN BERNARDINO CO., CA.

10 CAN TRAPS PUT IN 5/11/78; TAKEN UP 8/13/78

HABITAT: CREOSOTE/JOSHUA TREE

EL. 3280 T17N R12E S16SW

	6/3		6/9		6/16		6/23			6/24		7/7			7/21			7/28		8/12		8/13
	♂	♀	♂	♀	♂	♀	♂	♀	JUV	♂	♀	♂	♀	HATCH	♂	♀	HATCH	♂	♀	♂	♀	JUV
Sceloporus magister uniformis						1		1	1											1		1
Cnemidophorus tigris tigris		2				1		1														
Uta stansburiana stejnegeri														1			1	1				
Phrynosoma platyrhinos platyrhinos											1											
Crotaphytus wislizenii wislizenii															1							
Chionactis occipitalis occipitalis				3																		
Salvadora hexalepis mojavensis				1																		
Phyllorhynchus decurtatus perkinsi		1																				

SUMMARY:

Sceloporus magister uniformis - 1 Ad.♂, 2 Ad.♀, 1 Juv.♂, 1 Juv.♀	= 5
Cnemidophorus tigris tigris - 4 Ad.	= 4
Uta stansburiana stejnegeri - 1 Ad.♂, 2 Hatch.	= 3
Phrynosoma platyrhinos platyrhinos - 1 Ad.♀	= 1
Crotaphytus wislizenii wislizenii - 1 Ad.♂	= 1
Chionactis occipitalis occipitalis - 3 Ad.	= 3
Salvadora hexalepis mojavensis - 1 Ad.	= 1
Phyllorhynchus decurtatus perkinsi - 1 Ad.	= 1
	19 individuals of 8 species

FIGURE 1

CAN TRAP DATA FOR IVANPAH SPRINGS, SAN BERNARDINO CO., CA.
10 CAN TRAPS PUT IN 5/20/78; TAKEN UP 9/2/78
HABITAT: RIPARIAN
EL. 4000 T17N R13E S24SE

	5/26		6/2			6/3		6/10		6/16		6/17		6/23		7/7		7/21			7/28			8/12			9/2			
	♂	♀	♂	♀	JUV	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	JUV	♂	♀	HATCH	♂	♀	HATCH	♂	♀	JUV	HATC
Uta stansburiana stejnegeri			1										1		1		1						3	1		5	2		2♀	2
Sceloporus magister uniformis	1	3		1					1	1					2					1♀						1				
Cnemidophorus tigris tigris			2		1	1																								
Callisaurus draconoides																		1						1					1♂	
Crotaphytus wislizenii wislizenii																	1													
Coleonyx variegatus variegatus																												1		
Salvadora hexalepis mojavensis					1			1																						

SUMMARY:

Uta stansburiana stejnegeri	4 Ad.♂, 3 Ad.♀, 2 Juv.♀, 10 Hatch.	= 19
Sceloporus magister uniformis	2 Ad.♂, 7 Ad.♀, 1 Juv.♀, 1 Hatch.	= 11
Cnemidophorus tigris tigris	3 Ad., 1 Juv.	= 4
Callisaurus draconoides	2Ad.♂, 1 Juv.♂	= 3
Crotaphytus wislizenii wislizenii	1 Ad.♀	= 1
Coleonyx variegatus variegatus	1 Ad.♀	= 1
Salvadora hexalepis mojavensis	1 Ad.♂, 1 Juv.	= 2

41 individuals of 7 species

FIGURE 2

CAN TRAP DATA FOR 2 MI. WEST OF GREEN'S WELL, SAN BERNARDINO CO., CA.

8 CAN TRAPS PUT IN 6/24/78; TAKEN UP 9/2/78

HABITAT: DESERT WILLOW WASH
EL. 4840 T17N R13E S17NE

	7/7		7/21			7/28				8/12			9/1	
	♂	♀	♂	♀	JUV	♂	♀	JUV	HATCH	♂	♀	HATCH	JUV	HATCH
Uta stansburiana stejnegeri	1								3			5	1♂	1
Cnemidophorus tigris tigris				1			1				2		1	
Sceloporus magister uniformis					1♀									
Eumeces gilberti rubricaudatus								1						
Hypsiglena torquata deserticola					1									

SUMMARY:

Uta stansburiana stejnegeri	1 Ad.♂, 1 Juv.♂, 9 Hatch.	= 11
Cnemidophorus tigris tigris	4 Ad., 1 Juv.	= 5
Sceloporus magister uniformis	1 Juv.♀	= 1
Eumeces gilberti rubricaudatus	1 Juv.	= 1
Hypsiglena torquata deserticola	1 Juv.	= 1

19 individuals
of 5 species

FIGURE 3

CAN TRAP DATA FOR 1 MI. WEST OF GREEN'S WELL, SAN BERNARDINO CO., CA.

5 CAN TRAPS PUT IN 7/21/78; TAKEN UP 9/2/78

HABITAT: PINYON-JUNIPER

EL. 5120 T17N R13E S16NE

	8/12				9/1		
	♂	♀	JUV	HATCH	♂	♀	JUV
Uta stansburiana stejnegeri				1			1♂
Eumeces gilberti rubricaudatus							1
Xantusia vigilis vigilis			1				

SUMMARY: 4 individuals comprising 3 species

CAN TRAP DATA FOR PACHALKA SPRING, SAN BERNARDINO CO., CA.

3 CAN TRAPS PUT IN 5/27/78; TAKEN UP 7/7/78

HABITAT: RIPARIAN

EL. 4880 T17N R12½E S36NE

	7/7			
	♂	♀	JUV ♂	JUV ♀
Sceloporus magister uniformis			1	1

FIGURE 4

FIGURE 5. ABUNDANCE OF SNAKES IN RELATION TO MONTH OF YEAR CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA, 1978

Month	# individuals	Days in field
May	13	9
June	17	7
July	2	6
August	1	2
September	1	2

FIGURE 6. SNAKES FOUND WHILE NIGHT DRIVING CIMA ROAD
SAN BERNARDINO COUNTY, CALIFORNIA
MAY - JUNE, 1978
CREOSOTE/JOSHUA TREE HABITAT

Species	# individuals
Crotalus cerastes cerastes	4
Arizona elegans eburnata	4
Rhinocheilus lecontei lecontei	3
Phyllorhynchus decurtatus perkinsi	2
Crotalus scutulatus scutulatus	2
Pituophis melanoleucus deserticola	1

LIZARD AND AMPHIBIAN SPECIES OCCURRING IN EACH HABITAT OF THE CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA

	creosote	joshua tree -creosote	yuccas - cacti	desert willow wash	rocky slope	riparian	pinyon-juniper	whit fir
Bufo punctatus						X		
Eumeces gilberti rubricaudatus				X			X	
Urosaurus graciosus graciosus		X						
Coleonyx variegatus variegatus	X		X			X		
Sauromalus obesus obesus					X			
Xantusia vigilis vigilis			X				X	
Sceloporus occidentalis biseriatus						X	X	X
Phrynosoma platyrhinos platyrhinos	X	X	X	X	X	X		
Crotaphytus wislizenii wislizenii	X	X		X		X		
Crotaphytus collaris		X	X		X		X	
Sceloporus magister uniformis	X	X	X	X	X	X	X	
Cnemidophorus tigris tigris	X	X	X	X	X	X	X	
Callisaurus draconoides	X	X	X	X		X		
Uta stansburiana stejnegeri	X	X	X	X	X	X	X	X

TABLE 1

SNAKE SPECIES OCCURRING IN EACH HABITAT OF THE CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA

	creosote	joshua tree - creosote	mixed yuccas and cacti	desert willow wash	riparian	pinyon-juniper
Masticophis flagellum piceus	X					
Masticophis taeniatus taeniatus						X
Salvadora hexalepis mojavensis		X			X	
Pituophis melanoleucus deserticola	X	X			X	
Arizona elegans eburnata	X	X				
Rhinocheilus lecontei lecontei		X				
Lampropeltis getulus californiae		X				
Phyllorhynchus decurtatus perkinsi		X				
Chionactis occipitalis occipitalis		X				
Hypsiglena torquata deserticola			X	X		
Crotalus cerastes cerastes	X	X				
Crotalus scutulatus scutulatus	X	X				
Crotalus mitchelli pyrrhus			X			X

TABLE 2

TABLE 3. COMPOSITION AND ABUNDANCE OF HERPTILES OF CREOSOTE/JOSHUA TREE ASSOCIATION, CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA, 1978

Species	# individuals
Callisaurus draconoides	100
Uta stansburiana stejnegeri	54
Phrynosoma platyrhinos platyrhinos	36
Cnemidophorus tigris tigris	33
Sceloporus magister uniformis	21
Crotaphytus wislizenii wislizenii	19
Crotaphytus collaris	6
Crotalus cerastes cerastes	5
Arizona elegans eburnata	4
Rhinocheilus lecontei lecontei	3
Phyllorhynchus decurtatus perkinsi	3
Chionactis occipitalis occipitalis	3
Crotalus scutulatus scutulatus	2
Pituophis melanoleucus deserticola	2
Coleonyx variegatus variegatus	1
Masticophis flagellum piceus	1
Salvadora hexalepis mojavensis	1
Lampropeltis getulus californiae	1
Urosaurus graciosus graciosus	1

TABLE 4. COMPOSITION AND ABUNDANCE OF HERPTILES
OF MIXED YUCCAS/CACTI ASSOCIATION
CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA, 1978

Species	# individuals
Uta stansburiana stejnegeri	54
Callisaurus draconoides	41
Xantusia vigilis vigilis	14
Sceloporus magister uniformis	9
Phrynosoma platyrhinos platyrhinos	6
Cnemidophorus tigris tigris	2
Coleonyx variegatus variegatus	1
Crotaphytus collaris	1
Hypsiglena torquata deserticola	1
Crotalus mitchelli pyrrhus	1

TABLE 5. COMPOSITION AND ABUNDANCE OF HERPTILES OF DESERT WILLOW WASH HABITAT
CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA, 1978

Species	# individuals
Uta stansburiana stejnegeri	19
Callisaurus draconoides	8
Cnemidophorus tigris tigris	6
Sceloporus magister uniformis	3
Phrynosoma platyrhinos platyrhinos	2
Crotaphytus wislizenii wislizenii	2
Eumeces gilberti rubricaudatus	1
Hypsiglena torquata deserticola	1

TABLE 6. COMPOSITION AND ABUNDANCE OF HERPTILES OF UTAH AGAVE SLOPE HABITAT
CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA, 1978

Species	# individuals
Uta stansburiana stejnegeri	20
Crotaphytus collaris	11
Sauromalus obesus obesus	4
Sceloporus magister uniformis	3
Phrynosoma platyrhinos platyrhinos	2
Cnemidophorus tigris tigris	1

TABLE 7. COMPOSITION AND ABUNDANCE OF HERPTILES OF RIPARIAN HABITATS
CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA, 1978

Species	# individuals
Uta stansburiana stejnegeri	47
Sceloporus magister uniformis	14
Cnemidophorus tigris tigris	8
Callisaurus draconoides	6
Phrynosoma platyrhinos platyrhinos	3
Sceloporus occidentails biseriatus	2
Crotaphytus wislizenii wislizenii	2
Salvadora hexalepis mojavensis	2
Coleonyx variegatus variegatus	1
Pituophis melanoleucus deserticola	1
Bufo punctatus	1

TABLE 8. COMPOSITION AND ABUNDANCE OF HERPTILES
OF PINYON-JUNIPER HABITAT
CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA, 1978

Species	# individuals
Uta stansburiana stejnegeri	61
Sceloporus occidentalis biseriatus	27
Crotaphytus collaris	13
Sceloporus magister uniformis	11
Cnemidophorus tigris tigris	3
Xantusia vigilis vigilis	2
Masticophis taeniatus taeniatus	2
Eumeces gilberti rubricaudatus	1
Crotalus mitchelli pyrrhus	1

TABLE 9. COMPOSITION AND ABUNDANCE OF HERPTILES
OF WHITE FIR HABITAT
CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA, 1978

Species	# individuals
Sceloporus occidentalis biseriatus	4
Uta stansburiana stejnegeri	1

TABLE 10. SUMMARY OF SPECIES DATA, CLARK MOUNTAIN AREA, SAN BERNARDINO COUNTY, CALIFORNIA, 1978.

Species	Earliest date, Latest date	Habitat and # individuals	Range in elevation	T	R	S
Bufo punctatus	late May or early June	riparian-1	5240	17N	13E	15
Masticophis flagellum piceus	5/5	creosote-1	3680	16N	12E	27
Masticophis taeniatus taeniatus	6/23 9/1	pinyon-juniper-2	5120-5500	17N	13E	16, 21
Salvadora hexalepis mojavensis	6/2 6/10	creosote/joshua tree-1 riparian-2	3280-4000	17N 17N	12E 13E	16 24
Pituophis melanoleucus deserticola	5/26 6/9	creosote/joshua tree-2 riparian-1	3040-4000	16N 17N 17N	14E 12E 13E	23 28 24
Arizona elegans eburnata	5/10 6/16	creosote/joshua tree-4	3280-3620	16N 17N	12E 12E	16 16, 33
Rhinocheilus lecontei lecontei	5/12 5/26	creosote/joshua tree-3	3360-3540	16N 17N	12E 12E	16 33
Lampropeltis getulus californiae	7/7	creosote/joshua tree-1	4000	16N	12½E	24
Phyllorhynchus decurtatus perkinsi	6/3 6/23	creosote/joshua tree-3	3280-3440	16N 17N	12E 12E	4 16
Chionactis occipitalis occipitalis	6/9	creosote/joshua tree-3	3280	17N	12E	16
Hypsiglena torquata deserticola	5/26 7/21	yuccas/cacti-1 willow wash-1	3920-4840	17N	13E	17, 24

TABLE 10. SUMMARY CONTINUED.

Species	Earliest date, Latest date	Habitat and # individuals	Range in elevation	T	R	S
Crotalus cerastes cerastes	5/10 6/9	creosote/ joshua tree-5	2640-3360	16N 17N	14E 12E	1 20, 21, 28, 33
Crotalus scutulatus scutulatus	5/12 6/16	creosote/ joshua tree-2	3420-3660	16N	12E	4, 22
Crotalus mitchelli pyrrhus	6/2 8/12	yuccas/cacti-1 pinyon-jun.-1	3920-5140	17N	13E	16, 24
Eumeces gilberti rubricaudatus	7/28 9/1	willow wash-1 pinyon-jun.-1	4840-5120	17N	13E	16, 17
Urosaurus graciosus graciosus	5/12	creosote/ joshua tree-1	3760	17N	12E	11
Coleonyx variegatus variegatus	5/12 9/2	creosote-1 yuccas/cacti-1 riparian-1	3520-4000	16N 16N 17N	12E 14E 13E	27 5 24
Sauromalus obesus obesus	5/27 7/7	rocky slope-4	4400-4460	17N	12E	36
Xantusia vigilis vigilis	5/26 8/12	yuccas/cacti-14 pinyon-jun.-2	3760-5120	16N 17N	14E 13E	6 16, 24
Sceloporus occidentalis biseriatus	5/27 9/2	riparian-2 pinyon-jun.-27 white fir-4	4540-7100	17N 17N	12½E 13E	36 14-17, 23, 27, 28
Crotaphytus wislizenii wislizenii	5/4 8/13	creosote/ joshua tree-19 willow wash-2 riparian-2	2740-4900	16N 16N 17N 17N 17N 17½N	12E 14E 12E 13E 14E 13E	9, 15, 16, 22, 27, 28 12, 34 11, 15, 16, 28, 33 17, 24 34, 35 31

TABLE 10. SUMMARY CONTINUED.

Species	Earliest date, latest date	Habitat and # individuals	Range in elevation	T	R	S
Phrynosoma platyrhinos platyrhinos	5/4 9/1	creosote/ joshua tree-36 yuccas/cacti-6 willow wash-2 rocky slope-2 riparian-3	2680-4840	16N 16N 17N 17N 17N 17N	12E 14E 12E 12½E 13E 14E	4, 9, 15, 16, 22, 26, 27 1, 5, 6 12, 15, 16, 28, 33, 34, 36 36 5, 17, 24 33
Crotaphytus collaris	5/12 8/12	creosote/ joshua tree-6 yuccas/cacti-1 rocky slope-11 pinyon-jun.-13	3680-5360	16N 17N 17N 17N	12E 12E 12½E 13E	16 12, 36 1 6, 8, 14-17, 23
Sceloporus magister uniformis	5/4 9/2	creosote/ joshua tree-21 yuccas/cacti-9 willow wash-3 rocky slope-3 riparian-14 pinyon-jun.-11	2960-5280	16N 16N 17N 17N 17N 17N	12E 14E 12E 12½E 13E 14E	16, 22, 27 4-6 12, 14, 16, 33, 34, 36 36 5, 6, 14-17, 23, 24 34
Cnemidophorus tigris tigris	5/4 9/1	creosote/ joshua tree-33 yuccas/cacti-2 willow wash-6 rocky slope-1 riparian-8 pinyon-jun.-3	2680-4900	16N 16N 17N 17N 17N 17N	12E 14E 12E 12½E 13E 14E	4, 16, 22, 27 1, 5, 6 16, 17, 20, 21, 28, 34 36 16, 17, 23, 24 34, 35

TABLE 10. SUMMARY CONTINUED.

Species	Earliest date, latest date	Habitat and # individuals	Range in elevation	T	R	S
Callisaurus draconoides	5/4 9/2	creosote/ joshua tree-100 yuccas/cacti-41 willow wash-8 riparian-6	2653-4800	16N	12E	4, 9, 16, 22, 27, 28
				16N	14E	4-6, 34
				17N	12E	11, 12, 14-17, 20, 28, 33-36
				17N	12½E	1
				17N	13E	7, 17, 24
				17N	14E	33-36
Uta stansburiana stejnegeri	5/4 9/2	creosote/ joshua tree-54 yuccas/cacti-54 willow wash-19 rocky slope-20 riparian-47 pinyon-jun.-61 white fir-1	3160-6800	16N	12E	9, 16, 22, 26
				16N	14E	4-6
				17N	12E	11, 12, 15, 16, 33-36
				17N	12½E	1, 36
				17N	13E	5, 8, 14-17, 21-24, 27, 28
				17N	14E	33
				17½N	13E	31